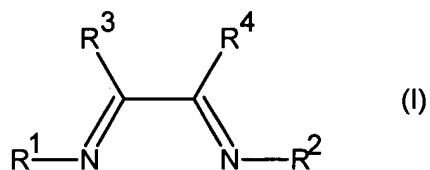


APPENDIX

PRESENT CLAIMS AS AMENDED UNDER 37 CFR §1.111

Claims 1-14 (canceled)

15. A 1,2-diimine of the formula (I),



where the symbols have the following meanings:

R<sup>1</sup> is a radical of the formula NR<sup>5</sup>R<sup>6</sup>,

R<sup>2</sup> is a radical of the formula NR<sup>5</sup>R<sup>6</sup> or an alkyl, aryl or cycloalkyl radical,

R<sup>5</sup> and R<sup>6</sup> together with the N atom form a 5-, 6- or 7-membered ring in which one or more of the -CH- or -CH<sub>2</sub>- groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further

carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated or substituted or unsubstituted,

and

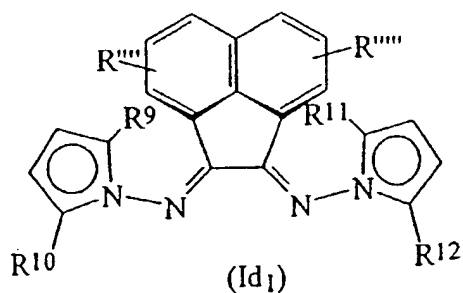
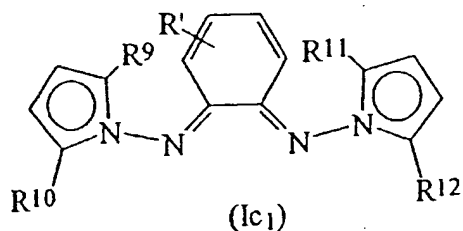
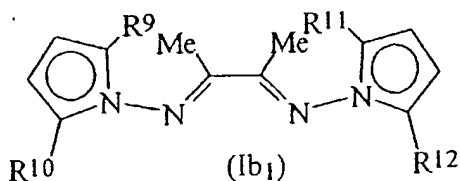
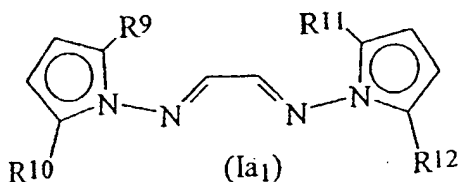
$R^3$ ,  $R^4$  are, independently of one another, H or alkyl, aryl or cycloalkyl radicals

or

$R^3$  and  $R^4$  together with the two imine carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted.

16. A compound as claimed in claim 15, wherein the radicals of the formula  $NR^5R^6$  are pyrrole radicals or radicals derived from pyrrole, where one or more -CH- groups in the pyrrole ring may be replaced by nitrogen, which may be unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted.

17. A compound as claimed in claim 16, wherein the pyrrole radicals or radicals derived from pyrrole are substituted in the 2 and 5 positions by C<sub>1</sub>-C<sub>6</sub>-alkyl groups, which may be linear, branched or substituted by heteroatoms, and/or aryl groups which may be unsubstituted or in turn substituted by C<sub>1</sub>-C<sub>6</sub>-alkyl groups which may be heteroatom-substituted.
18. A compound as claimed in claim 17 which has one of the formulae (Ia<sub>1</sub>), (Ib<sub>1</sub>), (Ic<sub>1</sub>) or (Id<sub>1</sub>):



where  $R^9$ ,  $R^{10}$ ,  $R^{11}$  and  $R^{12}$  are, independently of one another,  $C_1$ - $C_6$ -alkyl radicals

and

$R'$ ,  $R'''$ ,  $R''''$  are H or alkyl, cycloalkyl or aryl.

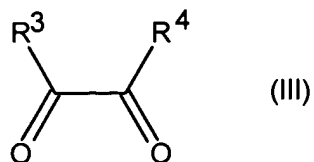
19. A process for preparing symmetrical compounds of the formula (I) as claimed in claim 15 in which  $R^1=R^2$  by reacting compounds of the formula (II)



where

$R^5$  and  $R^6$  together with the N atom form a 5-, 6- or 7-membered ring in which one or more of the -CH- or -CH<sub>2</sub>- groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated or substituted or unsubstituted,

with 1,2-diketo compounds of the formula (III)



where

$R^3, R^4$  are, independently of one another, H or alkyl, cycloalkyl or aryl radicals

or

$R^3$  and  $R^4$  together with the two carbonyl carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted

in a single-stage process under acidic reaction conditions in alcoholic solution or in the presence of a trialkylaluminum catalyst in an aprotic solvent in a ratio of the compound of the formula (II) to the compound of the formula (III) of 2:0.7-1.3.

20. A process for preparing unsymmetrical compounds of the formula (I) as claimed in claim 15 in which  $R^1 \neq R^2$  in a two-stage process in which:

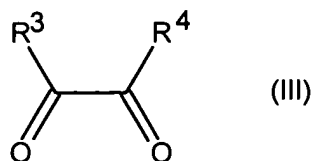
a) compounds of the formula (II)



where

$R^5$  and  $R^6$  together with the N atom form a 5-, 6- or 7-membered ring in which one or more of the -CH- or -CH<sub>2</sub>- groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated or substituted or unsubstituted,

are reacted in a first step with 1,2-diketo compounds of the formula (III)



where

$R^3, R^4$  are, independently of one another, H or alkyl, aryl or cycloalkyl radicals

or

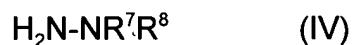
$R^3$  and  $R^4$  together with the two carbonyl carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted

in a ratio of the compounds of the formula (II) to the compounds of the formula (III) of 1:0.8-1.2 under acidic reaction conditions in alcoholic solution to form the corresponding monoimine and the solvent is subsequently removed under reduced pressure,

and

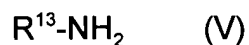
b) the monoimine is reacted in a second step with compounds of the formula

(II) which are different from the compounds of the formula (II) used in step a), or with compounds of the formula (IV)



where  $\text{R}^7$  and  $\text{R}^8$  are, independently of one another, alkyl, aryl or cycloalkyl radicals, or

with amines of the formula (V)



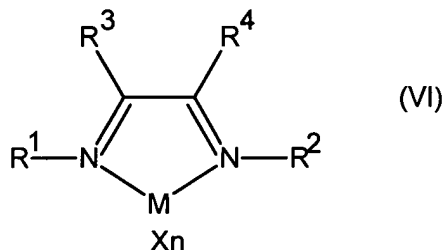
where

$\text{R}^{13}$  is an alkyl radical, an aryl radical or a cycloalkyl radical,

in an aprotic solvent, in the presence of a trialkylaluminum catalyst, in a ratio of the monoimine to a compound of the formula (II), (IV) or (V) of 1:0.8-1.2.

21. A compound of the formula (VI),





where the symbols have the following meanings:

$R^1$  is a radical of the formula  $NR^5R^6$ ,

$R^2$  is a radical of the formula  $NR^5R^6$  or an alkyl, aryl or cycloalkyl radical,

$R^5$  and  $R^6$  together with the N atom form a 5-, 6- or 7-membered ring in which one or more of the -CH- or -CH<sub>2</sub>- groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated or substituted or unsubstituted,

and

$R^3, R^4$  are, independently of one another, H or alkyl, aryl or cycloalkyl radicals

or

$R^3$  and  $R^4$  together with the two imine carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted;

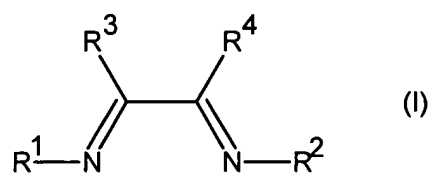
M is a transition metal of group 8, 9 or 10 of the Periodic Table of the Elements,

and

X is a halide or a  $C_1$ - $C_6$ -alkyl radical;

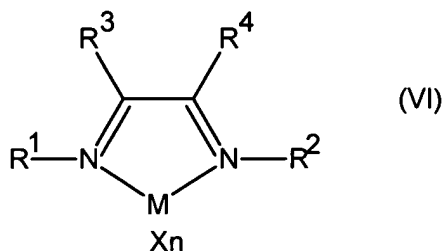
n is the valence of the metal M.

22. A compound as claimed in claim 21, wherein M=Pd or Ni and n=2 or 3.
23. A process for preparing compounds of the formula (VI) as claimed in claim 21 by reacting corresponding compounds of the formula (I)



- where R<sup>1-4</sup> are defined as for formula (VI),  
with salts of transition metals of groups 8, 9 and 10 of the Periodic Table of the Elements.
24. A process for preparing polyolefins by polymerization of unsaturated compounds in the presence of an activator and a compound of the formula (VI) as claimed in claim 21 as catalyst.
25. (previously presented) A process as claimed in claim 24, wherein the catalyst is present in homogeneous form in solution or in heterogeneous form immobilized on a support in the polymerization.

26. A process as claimed in claim 24, wherein methylaluminoxane or N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate is used as activator.
27. A process as claimed in claim 24, wherein an unsaturated compound or a combination of unsaturated compounds selected from among ethylene, C<sub>3</sub>-C<sub>20</sub>-monoolefins, cycloolefins and propylene is used.
28. A polyolefin which can be prepared by a process as claimed in claim 24.
29. A compound of the formula (VI),



where the symbols have the following meanings:

R<sup>1</sup> is a radical of the formula NR<sup>5</sup>R<sup>6</sup>,

$R^2$  is a radical of the formula  $NR^5R^6$ ,

$R^5$  and  $R^6$  together with the N atom form a 5-, 6- or 7-membered ring in which one or more of the -CH- or -CH<sub>2</sub>- groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated or substituted or unsubstituted,

and

$R^3$ ,  $R^4$  are, independently of one another, H or alkyl, aryl or cycloalkyl radicals

or

$R^3$  and  $R^4$  together with the two imine carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted;

M is a transition metal of group 8, 9 or 10 of the Periodic Table of the Elements,

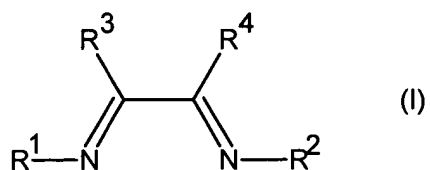
and

X is a halide or a C<sub>1</sub>-C<sub>6</sub>-alkyl radical;

n is the valence of the metal M.

30. A compound as claimed in claim 29, wherein M=Pd or Ni and n=2 or 3.

31. (new) A process for preparing compounds of the formula (VI) as claimed in claim 29 by reacting corresponding compounds of the formula (I)



where R<sup>1-4</sup> are defined as for formula (VI),

with salts of transition metals of groups 8, 9 and 10 of the Periodic Table of the

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Elements.